

### **REMARKS**

Applicants respectfully submit that this is a full and timely response to the non-final Office Action mailed by the U.S. Patent and Trademark Office on October 12, 2006. Claims 1-5, 8-12, 15-19 and 22-26 are pending in the present application. Claims 1 and 8 are amended. Claims 6, 7, 13, 14, 20 and 21 have been cancelled. New claims 22-26 have been added. Support for the subject matter added to claims 1 and 8 and new claim 25 can be found in the specification on at least page 3, lines 3-6; page 3, lines 19-20 and page 5, line 21 to page 6, line 14. Support for the subject matter of new claims 22 and 26 can be found in the specification on at least page 8, lines 2-3; page 11, lines 8-11; and page 19, lines 3-5. Support for the subject matter of new claim 23 can be found in the specification on at least page 11, lines 20-24. No new matter has been added. In view of the foregoing amendments and the following remarks, reconsideration and allowance of the present application and claims are respectfully requested.

#### **Rejections Under 35 U.S.C. § 103**

##### **Claims 1-3, 8-10 and 15-18**

Claims 1-3, 8-10 and 15-18 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,907,151 to Gramann et al. (hereinafter *Gramann*) in view of U.S. Patent No. 3,780,357 to Haitz (hereinafter *Haitz*). For a claim to be properly rejected under 35 U.S.C. § 103, “[t]he PTO has the burden under section 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.” *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988) (Citations omitted). Further, “[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.” *In re Fritch*, 972 F.2d 1260, 1266, 23 U.S.P.Q.2d 1780 (Fed Cir. 1992).

Amended claim 1 recites at least “[a] light emitting diode package comprising: a *one piece* ceramic substrate *and cup* for mounting a light emitting diode, said *one piece ceramic* substrate *and cup formed from an opaque ceramic material and* defining a cavity with a vertical ceramic sidewall, wherein said cavity is shaped to focus light in a predetermined direction.”

Amended claim 8 recites at least “[a] method for manufacture of a light emitting diode package comprising: forming a *one piece* ceramic substrate *and cup* for mounting a light emitting diode, said *one piece ceramic* substrate *and cup formed from an opaque ceramic material and* defining a cavity with a vertical ceramic sidewall, and said cavity having a bottom and a top, wherein said cavity is shaped to focus light in a predetermined direction.”

Applicants respectfully submit that the proposed combination fails to disclose, teach or suggest at least a light emitting diode package (LED) or a method for manufacturing an LED that includes a one piece ceramic substrate and cup for mounting a light emitting diode, wherein the one piece ceramic substrate and cup are formed from an opaque ceramic material and define a cavity with a vertical ceramic sidewall.

*Gramann* describes carrier units for radiation-emitting or radiation-receiving bodies, where the radiation-emitting body may be an LED, that include a channel, not a cup, for mounting a radiation-receiving body. (See, *e.g.*, the embodiment illustrated in Figs. 1 and 2, the embodiment illustrated in Figs. 3 and 4, the embodiment illustrated in Fig. 5 and the embodiment illustrated in Fig. 8). Specifically, the carrier units in these embodiments only include two side walls (reference nos. 10 and 11 in Figs. 1 and 2 and reference nos. 4 and 5 in Figs. 3, 4, 5 and 8) that form a channel.

*Gramann* also describes carrier units for radiation-emitting or radiation-receiving bodies that include a multiple piece ceramic substrate where the multiple pieces form a channel, not a cup. (See, *e.g.*, the embodiment illustrated in Figs. 3 and 4 and the embodiment illustrated in Fig. 5) Furthermore, *Gramann* describes a carrier unit for radiation-emitting or radiation-receiving bodies that includes a recess in the form of a pit (the embodiment illustrated in Figs. 6 and 7). However, in the only embodiment described by *Gramann* that includes a recess that is not a channel, *i.e.* the pit of Figs. 6 and 7, *Gramann* specifies that the pit “becomes narrower from the top to the bottom”. (See *Gramann* at col. 7, lines 48-49). Thus, the embodiment having a pit (illustrated in Figs. 6 and 7) has sidewalls that are angled and that are not vertical. Thus, *Gramann* fails to disclose, teach or suggest a light emitting diode package that includes at least a one piece ceramic substrate and cup for mounting a light emitting diode, wherein the one piece ceramic substrate and cup define a cavity with a vertical ceramic sidewall.

*Gramann* also fails to disclose, teach or suggest a light emitting diode package that includes a one piece ceramic substrate and cup formed from an opaque ceramic material. *Gramann* describes only carrier units that are “transparent to the radiation emitted and/or

received by the [radiation emitting or radiation receiving] body” (See *Gramann*, col. 5, lines 66-67). In each of the embodiments described by *Gramann*, the radiation that is received or transmitted by the radiation-receiving or radiation-transmitting body, for example an LED, is received or transmitted through the carrier plate 7 to and through a means for focusing radiation 21 that is located on the opposite side of the carrier plate 7 from the radiation-emitting body 6.

*Haitz* also fails to disclose, teach or suggest a light emitting diode package that includes a one piece ceramic substrate and cup for mounting a light emitting diode, wherein the one piece ceramic substrate and cup are formed from an opaque ceramic material and define a cavity. *Haitz* describes multiple piece bodies (Figs. 1-7) that include walls formed from “molded white plastic” (See *Haitz*, Abstract and col. 5, lines 19-20) and not ceramic. As previously stated, *Gramann* describes carrier units that receive and/or transmit radiation, e.g. light, through the carrier unit and clearly states that “the carrier unit is composed of a material which is transparent to at least a portion of a radiation emitted and/or received by the body” (See *Gramann*, col. 2, lines 66-67).

Thus, it would not have been obvious to modify the carrier units described by *Gramann* so that the carrier unit is formed from an opaque ceramic material, for example an alumina or aluminum nitride based material, because opaque materials are not transparent to the radiation transmitted by an LED and thus would not transmit light from an LED. Moreover, *Haitz* describes packages with plastic sidewalls not ceramic sidewalls.

Thus, the proposed combination of *Gramann* and *Haitz* fails to disclose, teach or suggest an LED package or a method for manufacturing an LED package that includes at least a one piece ceramic substrate and cup for mounting an LED, wherein the one piece ceramic substrate and cup are formed from an opaque ceramic material and define a cavity having a vertical ceramic sidewall. Additionally, it would not have been obvious to modify *Gramann* so that any of the carrier units described therein are formed from an opaque material for at least the reasons discussed above.

Accordingly, Applicants respectfully submit that amended independent claims 1 and 8 and new claims 25-26 are allowable. Further, Applicants respectfully submit that dependent claims 2-3, which depend directly from allowable claim 1, and claims 9-10 and 15-18, which depend either directly or indirectly from allowable claim 8, are allowable for at least the reason that they depend from allowable independent claims. *In re Fine, supra*. Accordingly, Applicants request that the rejection of claims 1-3, 8-10 and 15-18 be withdrawn.

Claim 4-5 and 11-12

Claim 4-5 and 11-12 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over *Gramann* in view of *Haitz* and further in view of U.S. Patent No. 6,335,946 to *Ishanaga* (hereinafter *Ishanaga*).

*Gramann* and *Haitz* both fail to disclose, teach or suggest, individually or in combination, an LED package that includes a one piece ceramic substrate and cup for mounting a light emitting diode, wherein the one piece ceramic substrate and cup are formed from an opaque ceramic material and define a cavity with a vertical ceramic sidewall as discussed above. *Ishanaga* is cited in the Office Action for teaching various shape cavities, for example rectangular, trapezoidal, *etc.* However, the proposed combination of *Gramann*, *Haitz* and *Ishanaga* fails to disclose, teach or suggest an LED package or a method for manufacturing an LED package that includes at least a one piece ceramic substrate and cup for mounting a LED, wherein the one piece ceramic substrate and cup are formed from an opaque ceramic material and have a vertical ceramic sidewall.

Applicants respectfully submit that claims 4-5, which depend directly from allowable claim 1, and claims 11-12, which depend directly from allowable claim 8 are also allowable for at least the reason that they depend from allowable independent claims. *In re Fine, supra.*

Claim 19

Claim 19 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over *Gramann* in view of *Haitz* and further in view of U.S. Patent No. 5,177,593 to *Abe* (hereinafter *Abe*).

As stated above, *Gramann* in view of *Haitz* fails to disclose, teach or suggest, individually or in combination, an LED package that includes at least a one piece ceramic substrate and cup for mounting a light emitting diode, wherein the one piece ceramic substrate and cup are formed from an opaque ceramic material and define a cavity having a vertical ceramic sidewall as discussed above. *Abe* is cited in the Office Action for teaching “an optically transparent material forming concaved layer” over an LED. However, the proposed combination of *Gramann*, *Haitz* and *Abe* fails to disclose, teach or suggest an LED package or a method for manufacturing an LED package that includes a one piece ceramic substrate and cup for mounting an LED, wherein the one piece ceramic substrate and cup are formed from an opaque ceramic material and form a cavity having a vertical ceramic sidewall.

Accordingly, Applicants respectfully submit that claim 19 is allowable, for at least the reason that claim 19 depends directly from allowable independent claim 8. *In re Fine, supra*.

New Claims 22-26

Claim 22 is allowable for at least the reason that new claim 22 depends directly from allowable claim 1. Claims 23 and 24 are allowable for at least the reason that new claims 23 and 24 depend directly from allowable claim 8. Claim 25 is allowable for at least the reason that new claim 25 includes subject matter that it not disclosed, taught or suggested by the cited references. Claim 26 is allowable for at least the reason that claim 26 depends directly from allowable claim 25.

**CONCLUSION**

Applicants respectfully submit that pending claims 1-5, 8-12 and 15-19 and new claims 22-26 are allowable in light of the present amendments. Should the Examiner have any comment regarding Applicants' response or believe that a teleconference or an Examiner's Amendment would expedite prosecution of the pending claims, Applicants respectfully request the Examiner to contact Applicants' undersigned attorney at the telephone number provided below.

Respectfully submitted,

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